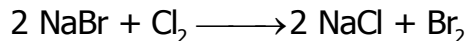


Stoichiometry 1 KEY

1. How many grams of sodium bromide are needed to make 50 grams of bromine gas from sodium bromide?



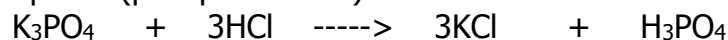
$$50\text{g Br}_2 \times \frac{1\text{mol Br}_2}{160\text{g Br}_2} \times \frac{2\text{mol NaBr}}{1\text{mol Br}_2} \times \frac{103\text{g NaBr}}{1\text{mol NaBr}} = 64.4\text{g NaBr}$$

2. How many grams of potassium permanganate are needed to produce 1.75 moles of manganese chloride?



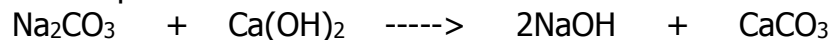
$$1.75\text{mol MnCl}_2 \times \frac{2\text{mol KMnO}_4}{2\text{mol MnCl}_2} \times \frac{158\text{g KMnO}_4}{1\text{mol KMnO}_4} = 276.5\text{g KMnO}_4$$

3. If 120 g of potassium phosphate react with hydrogen chloride, how many grams of hydrogen phosphate (phosphoric acid) are formed?



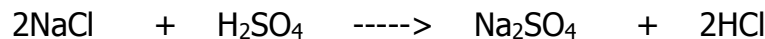
$$120\text{g K}_3\text{PO}_4 \times \frac{1\text{mol K}_3\text{PO}_4}{212\text{g K}_3\text{PO}_4} \times \frac{1\text{mol H}_3\text{PO}_4}{1\text{mol K}_3\text{PO}_4} \times \frac{98\text{g H}_3\text{PO}_4}{1\text{mol H}_3\text{PO}_4} = 55.5\text{g H}_3\text{PO}_4$$

4. When 80.0 grams of sodium carbonate react with calcium hydroxide, what mass of calcium carbonate is produced?



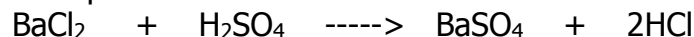
$$80\text{g Na}_2\text{CO}_3 \times \frac{1\text{mol Na}_2\text{CO}_3}{106\text{g Na}_2\text{CO}_3} \times \frac{1\text{mol CaCO}_3}{1\text{mol Na}_2\text{CO}_3} \times \frac{100\text{g CaCO}_3}{1\text{mol CaCO}_3} = 75.5\text{g CaCO}_3$$

5. If 90.0 grams of sodium chloride react with sulfuric acid, how many grams of sodium sulfate are produced?



$$90\text{g NaCl} \times \frac{1\text{mol NaCl}}{58.5\text{g NaCl}} \times \frac{1\text{mol Na}_2\text{SO}_4}{2\text{mol NaCl}} \times \frac{142\text{g Na}_2\text{SO}_4}{1\text{mol Na}_2\text{SO}_4} = 110.2\text{g Na}_2\text{SO}_4$$

6. If 100.0 grams of barium chloride react with sulfuric acid, how many grams of barium sulfate are produced?



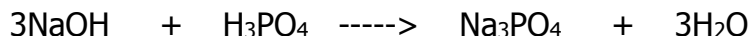
$$100\text{g BaCl}_2 \times \frac{1\text{mol BaCl}_2}{207\text{g BaCl}_2} \times \frac{1\text{mol BaSO}_4}{1\text{mol BaCl}_2} \times \frac{233\text{g BaSO}_4}{1\text{mol BaSO}_4} = 112.6\text{g BaSO}_4$$

7. How many grams of oxygen will be produced by decomposing 480 grams of potassium chlorate?



$$480\text{g KClO}_3 \times \frac{1\text{mol KClO}_3}{122\text{g KClO}_3} \times \frac{3\text{mol O}_2}{2\text{mol KClO}_3} \times \frac{32\text{g O}_2}{1\text{mol O}_2} = 188.8\text{g O}_2$$

8. How many grams of sodium hydroxide will react with 150 grams of phosphoric acid?



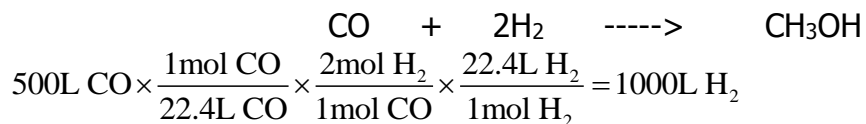
$$150\text{g H}_3\text{PO}_4 \times \frac{1\text{mol H}_3\text{PO}_4}{98\text{g H}_3\text{PO}_4} \times \frac{3\text{mol NaOH}}{1\text{mol H}_3\text{PO}_4} \times \frac{40\text{g NaOH}}{1\text{mol NaOH}} = 183.7\text{g NaOH}$$

9. If 120 grams of mercury (II) oxide are decomposed by heat, what volume of oxygen is produced?

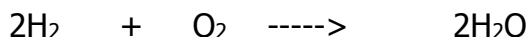


$$120\text{g HgO} \times \frac{1\text{mol HgO}}{217\text{g HgO}} \times \frac{1\text{mol O}_2}{2\text{mol HgO}} \times \frac{22.4\text{ L O}_2}{1\text{mol O}_2} = 6.2\text{L O}_2$$

10. In the production of methanol, how many liters of hydrogen are needed to react with 500 liters of carbon monoxide?

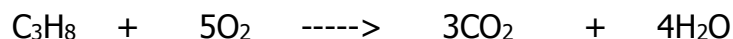


11. To produce water, how many liters of oxygen are needed to react with 600 liters of hydrogen?



$$600\text{L H}_2 \times \frac{1\text{mol H}_2}{22.4\text{L H}_2} \times \frac{1\text{mol O}_2}{2\text{mol H}_2} \times \frac{22.4\text{L O}_2}{1\text{mol O}_2} = 300\text{L O}_2$$

12. If 200 liters of propane are burned, what volume of carbon dioxide is produced?



$$200\text{L C}_3\text{H}_8 \times \frac{1\text{mol C}_3\text{H}_8}{22.4\text{L C}_3\text{H}_8} \times \frac{3\text{mol CO}_2}{1\text{mol C}_3\text{H}_8} \times \frac{22.4\text{L CO}_2}{1\text{mol CO}_2} = 600\text{L CO}_2$$